3.2   WATER QUALITY SUMMARY OF REACH II

Basin Reach II represents the Wichita River and Little Wichita River watersheds from the confluence with the Red River to their headwaters (Clay County to Cottle/King/Dickens Counties). Reach II contains five subwatersheds, ten classified stream segments and 4,951 square miles of contributing drainage in Texas.
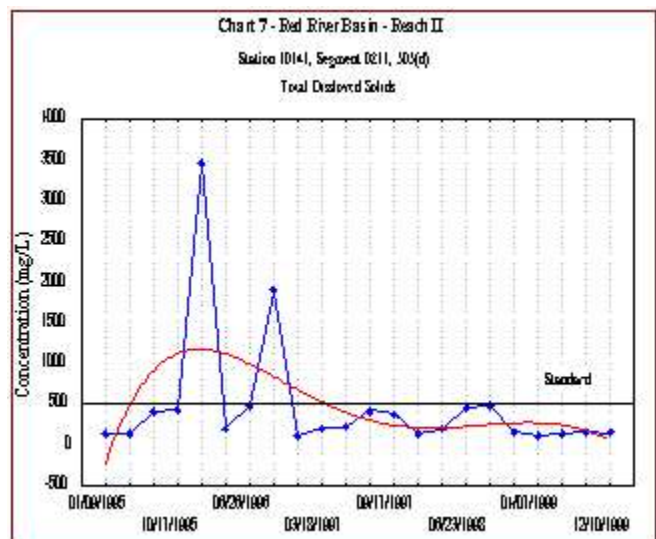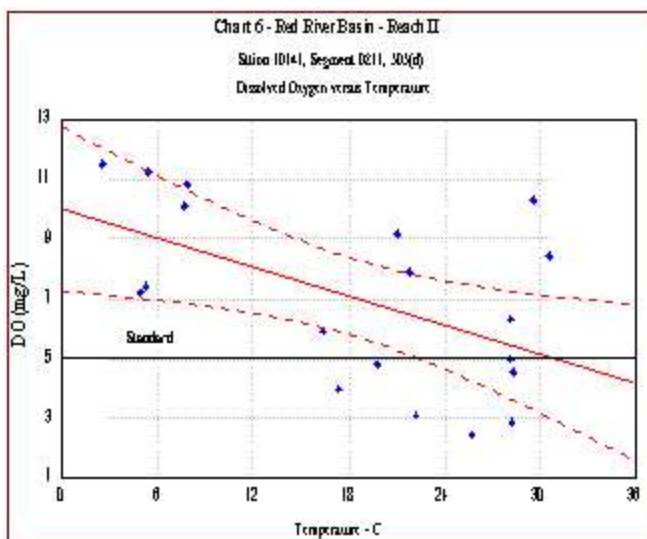
Ten classified stream segments (0211, 0212, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0226) are in this basin reach. There are 38 permitted municipal and industrial discharges, 25 permitted solid waste disposal sites, approximately 2,137 petroleum storage tanks, 15 confined animal feeding operations, and about 158,163 persons within this reach. There are 30 water quality monitoring stations (20 routine and 10 systematic) that provided data for screening in this basin reach. The Authority conducted 49 monitoring events during this period and 1,514 parameters were evaluated.
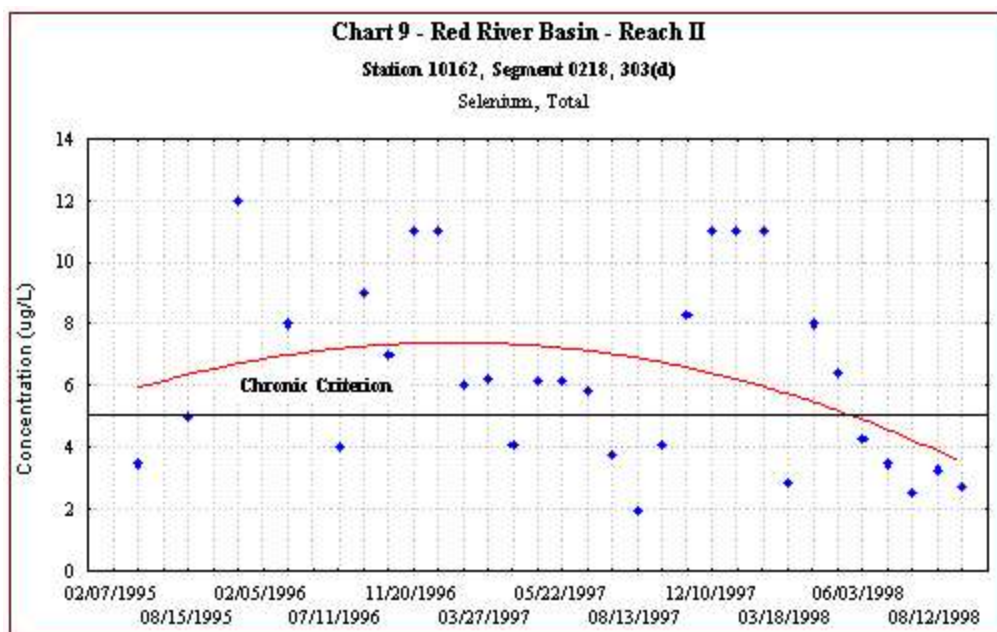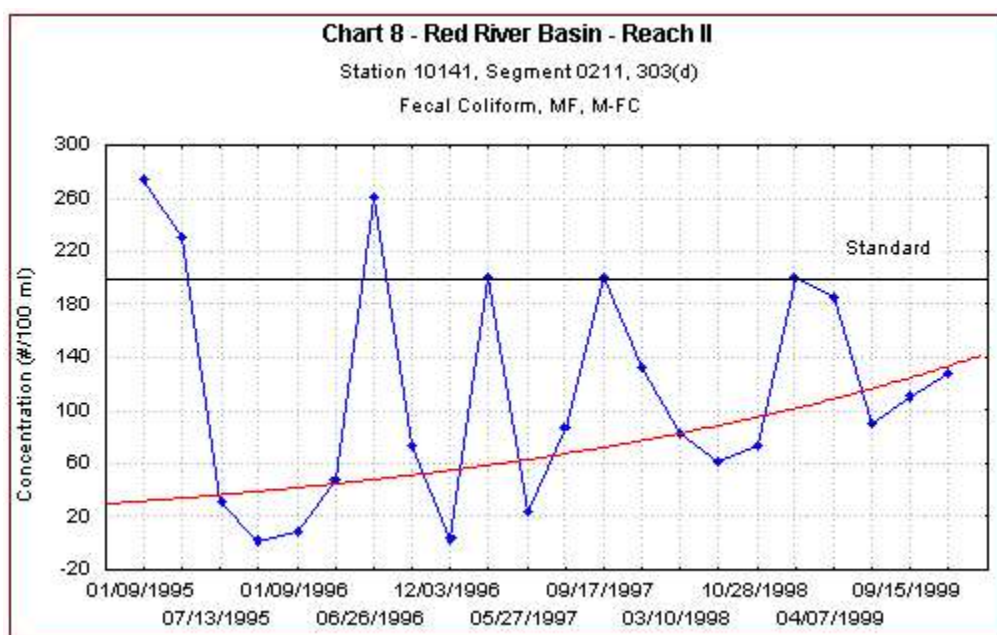
Results of the data screening indicated that dissolved oxygen (DO), fecal coliform (FC) and total dissolved solids (TDS) exceeded the screening criteria in segment 0211 (Little Wichita River in Clay County). Dissolved oxygen and TDS have exceeded stream standards in previous assessments and the segment was placed on the CWA §303(d) list of impaired water bodies for both constituents. Fecal coliform also exceeded the screening criteria and showed several elevated levels over the period. Refer to **Charts 6, 7** and **8** for details. The exceedances for FC and TDS may be attributed to low-flow conditions during summer months and local livestock watering from the river. The low DO levels can be attributed to the segment being hydrologically modified by Lake Arrowhead and only flows when water is released from the lake to meet water supply needs of Henrietta, or after localized rainfall events.
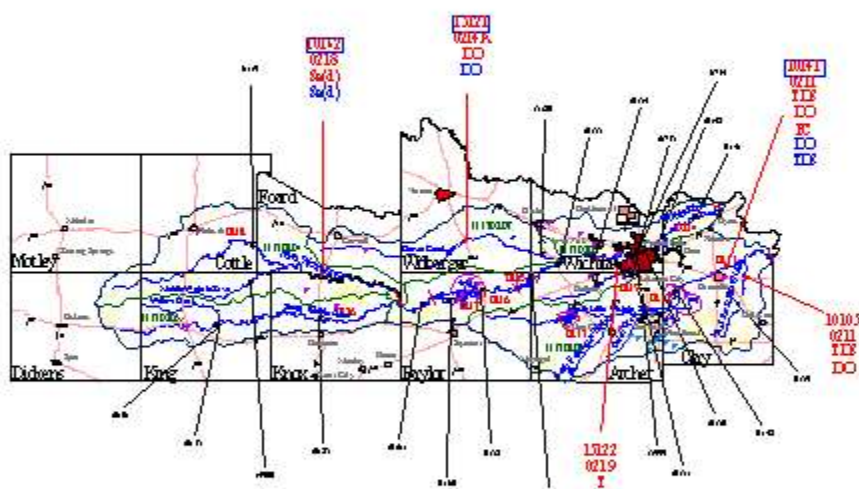
The data screening also indicates that FC, TDS and pH were identified as parameters warranting further study in stream segment 0214, while nutrients within Reach II appear to be declining since none exceeded the screening criteria. However, stream segment 0214A (Beaver Creek in Wilbarger County) and 0218 (North Wichita River in Wichita County) are included on the CWA §303(d) list for depressed dissolved oxygen and high selenium levels, respectfully. Refer to **Table 3** for a statistical summary of parameters exceeding the screening criteria.

There were insufficient data to screen metals, except for selenium in segment 0218. Total selenium exceeded the screening criteria, but has shown a sharp decline during the last three years of the period. Selenium is a naturally occurring metal found in soil and associated with previous copper mining activities conducted within the area. An independent study conducted by the US Army Corps of Engineers, Tulsa District showed a decline in the selenium levels and projects that the concentrations will not exceed toxicity levels over the next 50 years. Refer to **Chart 9** depicting selenium concentrations over time in segment 0218 (station 10162). Further study is needed to determine whether selenium is a residual metal from previous mining activities or a naturally occurring problem. In either case, it should be determined whether impounding the water in a reservoir will have an adverse impact over time. The levels of selenium appear to correlate closer to storm water runoff than gradual dissolution of soil structures.

Although no stations in Reach II reported chloride levels exceeding the stream standards, they continue to present a concern due to the elevated levels limiting use of the water resources. Chlorides have shown a slight increase in concentrations during low-flow conditions in segments 0211, 0214, and Beaver Creek (station 15120). Chloride levels appear to be originating from predominately naturally occurring factors, such as salt springs located in the upper reaches of this watershed. Chloride control features are being implemented to reduce the naturally occurring chlorides near the identified sources.

Chart 8 - Red River Basin - Reach II
Station 10141, Segment 0211, 303(d)
Fecal Coliform, MF, M-FC

Chart 9 - Red River Basin - Reach II
Station 10162, Segment 0218, 303(d)
Selenium, Total

RED RIVER BASIN
FACTORS INFLUENCING WATER QUALITY

Reach II

Figure 2